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# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE.



DECEMBER 1, 1934

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See Page 340

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SCIENCE SERVICE PUBLICATION

## SCIENCE NEWS LETTER

VOL. XXVI



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Current Science

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## DO YOU KNOW?

Moscow is using new "trolley busses" which are auto busses considerably bigger than street cars, and seating 84 passengers.

A school for bakers and a laboratory for bread research have been established in Paris.

The Children's Hospital at Washington, D. C., has a clinic for cross-eyed children.

Laundering garments in hard water is reported to shorten their life by 20 to 40 per cent.

Tenmarq, a new hybrid wheat, got its name from the pedigree number of the male parent Ten-Sixty-Six and the female parent Marquis.

The so-called "alkali disease" of livestock in the Great Plains is not caused by alkali water or alkali spots in the soil, but the real cause is unknown.

British engineers are studying the problem of making automobile horns more effective and less objectionable in sound.

Government scientists have found a new method, cheap and effective, of retarding mold on grapes in shipping or storage.

Near the civic center of ancient Athens, archaeologists recently unearthed some of the official weights and measures which were kept there for standards.

Medical massage is a field open to blind people in Russia.

A dry lightning storm in California in August started some 250 forest fires.

Apples kept in cold storage bruise more easily than fruit just picked.

It is reported that 74 per cent. of the medical students in Soviet Russia today are women.

Chemists have found that alunite, often proposed as a source of potash, must be utilized fully if the operation is to be a commercial success.

Rubber research workers have developed a plastic tree cavity filler which they believe will not have disadvantages of previous substances used.

A chart published by the U. S. Weather Bureau shows the average dates of the first killing frost in autumn in all parts of the country.

The latest equipment of the modern fisherman—the forked landing net—is now found to have been an old Egyptian idea, later lost and forgotten.

The Secretary of the Interior has made a nation-wide appeal to hunters to guard against harming the pitifully small remnant of Trumpeter Swans.

China's secret of making true porcelain baffled Europeans for several centuries, until Bottcher discovered it by his experiments, in 1709.

## WITH THE SCIENCES THIS WEEK

## ARCHAEOLOGY

Where did Jacob dream? p. 350.

## ASTRONOMY

How many new faint galaxies are included in the Harvard census? p. 344.

What happened to the Leonid meteors? p. 344.

## CHEMISTRY

What newly discovered isotope has the same atomic weight as oxygen? p. 340.

## FORESTRY-CLIMATOLOGY

How would the proposed shelter belt of trees affect crops? p. 342.

## MATHEMATICS

How does the new mathematical research of Sir Shah Sulaiman restore classical mechanics to its former prestige? p. 339.

## MEDICINE

Could you bring the dead to life? p. 341.

How is leprosy contracted? p. 345.

Why is the black widow spider considered a greater menace than the rattlesnake? p. 339.

## PHYSIOLOGY

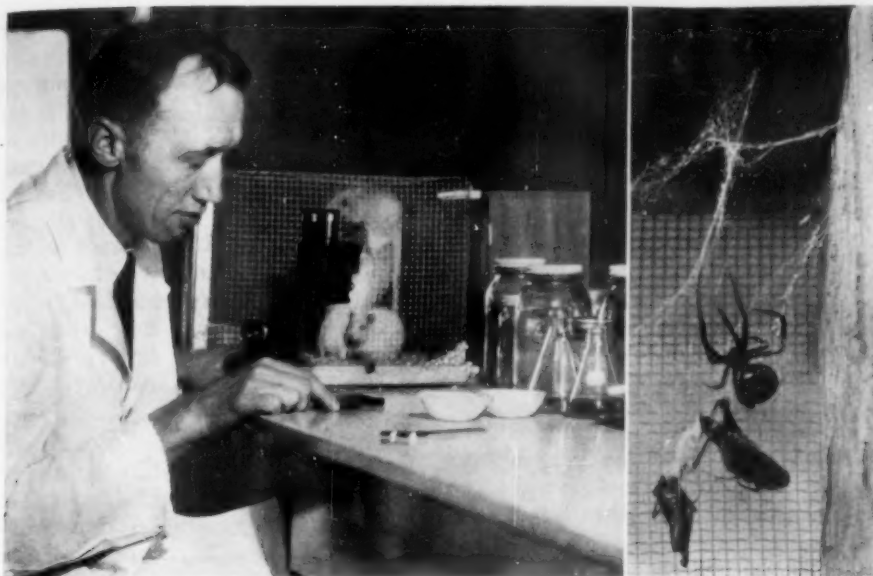
How much difference is there between the weights of Negroes' and white men's brains? p. 345.

What effect has high blood pressure? p. 344.

## PUBLIC HEALTH

Is an outbreak of "sleeping sickness" a possibility in your community? p. 344.

Is smallpox wiped out? p. 345.



#### THE BLACK WIDOW FOILED

Dr. Fred D'Amour, University of Denver professor, has perfected a serum that is successful in treating victims of the black widow spider (shown in inset) whose bite is painful and often fatal. These spiders were once found only in rural districts but are now invading the cities. This one caught her grasshopper prey in a web built in a Denver coal bin. The web is characteristic, being entirely without pattern, a loose helter-skelter structure of very coarse strands which crackle when torn.

#### MEDICINE

### Develops Anti-Venom Serum For Black Widow

A SERUM that counteracts the effect of the often fatal bite of the black widow spider has been perfected by Prof. Fred D'Amour of the University of Denver.

This serum is believed to be the first highly potent anti-venom serum against the bite of these spiders.

Obtained from the blood of rats that had been given regular small injections of venom removed from the spiders' glands, the serum first proved its worth when a vineyard worker was brought to Prof. D'Amour's laboratory suffering from a black widow spider bite. Although three hours elapsed from the time this man was bitten until a small quantity of serum was administered under a physician's guidance, immediate relief was given.

Due to their alarming increase in numbers throughout the country, the black widow spiders are believed likely to become a far greater menace than the rattlesnake. For whereas the rattlesnake is found only in isolated places, these poisonous spiders are invading cities. Lately they have been found in bedrooms and garages, as well as in furnace rooms. Several deaths from their bites have been reported in the United States within the past two years.

While the alleviation of mankind's suffering can not be measured in dollars and cents, the new serum may prove to be worth thousands of dollars to the agricultural world alone. Vineyardists in western Colorado, parts of Utah, and northern California reported several instances where entire crops of grapes were unpicked last year, due to the pickers' refusal to work in vineyards infested by black widow spiders. In some regions throughout the Midwest tomato vines were badly infested too. With a protective serum available, pickers will no longer fear to carry on their work.

Prof. D'Amour first became interested in the black widow spider upon hearing of the work of Dr. Allan Blair of the University of Alabama. This intrepid scientist allowed himself to be bitten by a large specimen of black widow spider and suffered agonizing pain for hours, in order to allow fellow scientists to witness and record every symptom. (Turn to Page 340)

#### MATHEMATICS

## New Mathematical Theory May Overthrow Einstein Concepts

Sir Shah Sulaiman, Indian Justice and Distinguished Mathematician, Links Newton Mechanics With Relativity

A NEW mathematical theory of relativity which may overthrow the world-famous theories of Prof. Albert Einstein has been presented before the United Provinces Academy of Sciences by Sir Shah Sulaiman, Kt., M.A., LL.D. and chief justice of the High Court of Allahabad.

The distinguished Indian justice is an Oxford-trained mathematician with a wide reputation in the field of relativistic mathematics.

Scientists throughout the world are checking through the mathematics of Sir Shah's report because it appears to be a sane borderline between classical mechanics of Sir Isaac Newton and the newer concepts of Prof. Einstein.

The mathematical equations of the Indian justice-scientist reduce to the equations of Newton as a first approximation and likewise to those of Einstein as a second approximation.

Describing such a two-way working of the new theory, Sir Shah reports, "If it can be shown that the ordinary principles of dynamics, when applied to moving bodies, themselves yield modified forms of equations, which as a first approximation reduce themselves to Newton's forms, and as a second approximation to Einstein's forms, the Newtonian mechanics would be restored to the eminent position it occupied before its dethronement by relativity, and there would no longer be an absolute necessity to accept the extraordinary hypotheses on which relativity is founded."

Sir Shah points out that from his new theory, theoretical values derived from equations tally more exactly with observed values. The predicted deflection of star light as it passes close to the sun comes out to be 2.66 times that predicted by New- (Turn to Page 349)



The bite itself is not painful, but within an hour or so after it has been inflicted a numbing pain ascends the extremity bitten and localizes itself in the abdominal muscles, back and chest. Spasms and intense suffering follow. A contraction of the chest muscles also occurs, making it difficult for the victim to breathe. High fever, nausea, vomiting and unconsciousness are other symptoms.

Previous treatment has consisted of narcotic drugs to relieve the pain, hot baths, and a convalescent serum. The latter has not been satisfactory, Prof. D'Amour said.

The new serum gives prompt relief if given as long as three and one-half hours after the bite, an important practical point, since it is often people in rural districts, several hours away from medical aid, who are bitten.

The black widow's venom is more poisonous, weight for weight, than the rattlesnake's. The spider, known to scientists as *Latrodectus mactans*, is large and shiny jet-black, with a large bulbous abdomen and long slender legs, covering a span of nearly two inches.

The lower side of its abdomen is

marked with red warning signs, in most cases, by two triangular spots with points touching, roughly resembling an hour glass. This resemblance gives the spider another of its popular names, the hour glass spider. Far more deadly than the male, the female is four to five times as large as her mate, which she kills soon after the breeding season.

These spiders were once found only in rural districts—in grain bins, barns, chicken coops, grape arbors, etc. But within the past two years they have become extremely urban.

Their webs may be recognized immediately. For they are built entirely without pattern or design, a loose helter-skelter structure of very coarse strands which crackle when torn.

The spiders are extremely timid, and like the rattlesnake, they never attack unless molested. But the danger lies in persons, unwittingly disturbing them. Many have been bitten, unknowingly grasping the spider in a cluster of grapes or in taking tomatoes from the vine. Many city dwellers have been bitten while asleep, the spider having fallen from the ceiling to the bed.

*Science News Letter, December 1, 1934*

#### CHEMISTRY

## New Kind of Nitrogen Found; Then Turned into Oxygen

### Neutrons Traveling Millions of Miles per Hour Used In Experiments; Energy Turned to Cancer-Curing Rays

**T**HE discovery of a new variety of nitrogen which radioactively transmutes itself into oxygen was announced by Dr. William D. Harkins of the University of Chicago to the National Academy of Sciences.

Thus for the first time it is known that one of the two principal elements in air can change into the other, the oxygen necessary to our very breath.

By smashing atoms with speeding neutrons and recording the atomic fireworks resulting in some 30,000 photographs, Dr. Harkins and his colleagues obtained these results.

The neutron is the only completely unclothed or "nude" nucleus or atomic heart. All other atoms have a central core nucleus and a diffuse aura of negative electrons. Discovered in 1932, neutrons are the smallest atoms known, with less than a millionth of a millionth

the volume of the smallest atom known earlier. By virtue of their small size and the absence of an electrical charge they pass readily through all other atoms and therefore through solids or liquids. Only when a neutron strikes another atom nucleus does it change direction.

The new isotope or variety of nitrogen just discovered has a mass sixteen times that of ordinary hydrogen, the unit used in weighing atoms. It is therefore just the same weight as the ordinary oxygen of air, also mass 16. Ordinary nitrogen is known to be lighter, mass 14. The mass 16 nitrogen was made by Dr. Harkins by flinging neutrons at the element fluorine. It was assumed by Dr. Harkins that this new nitrogen would be radioactive and spontaneously disintegrate, giving off an electron to form ordinary oxygen. Prof.

Enrico Fermi of Rome verified this actual transmutation.

The only way that an atomic nucleus can be smashed or disintegrated is for the nucleus coming in as a projectile to be captured, after which the new combined nucleus explodes, Dr. Harkins declared. Scientists have generally believed that it might be possible for the bombarding projectile to disintegrate without being captured, but Dr. Harkins has now proved that only when the projectile gets into the heart of the attacked atom is there sufficient energy for disintegration carried in.

"For producing these gamma rays which are most efficient in the cure of cancer," Dr. Harkins said, "the nucleus of an atom is found to be an extremely efficient machine, transforming kinetic energy into gamma rays. The energy of the gamma rays is found to increase rapidly with increase in the energy of the neutrons used in the bombarding."

Speeds of 126,000,000 miles per hour or 35,000 miles per second were found for some of Dr. Harkins' neutrons. This extremely high velocity corresponds to a kinetic energy of 16,000,000 electron volts.

These high velocity neutrons were used to disintegrate nitrogen, fluorine, neon and possibly carbon. Dr. Harkins found that neutrons of less energy than 1,900,000 electron volts in no case were able to disintegrate a nucleus. In all these disintegrations kinetic energy disappears and is transformed into gamma rays or very penetrating light rays. In certain disintegrations the gamma ray energy emitted has been as high as 12,000,000 volts.

*Science News Letter, December 1, 1934*

#### ENGINEERING

## Propellers of "Queen Mary" Move At Touch of Finger

**T**HE cover illustration of SCIENCE NEWS LETTER this week is the striking view of one of the four great propellers which will drive the new British Cunard-White Star liner Queen Mary.

While each propeller weighs 35 tons they are balanced so delicately that the touch of a finger will move them.

The propellers are the largest manganese bronze units ever cast, weighing 55 tons apiece in the rough state. Eight weeks was required to construct each mold and after the pouring it required two weeks for cooling.

*Science News Letter, December 1, 1934*

MEDICINE

# Can the Dead Be Given Life?

Scientists Answer Both Yes and No, For It All Depends Upon How Dead the Victim Is; Brain Is First to Die

By JANE STAFFORD

**T**HRUSTING an electric needle into the heart to start it beating again, adrenalin injections directly into the heart, the pulmotor, artificial respiration—all these methods science has devised for resuscitating or reviving a person who has apparently died. But do they really restore the dead to life?

It all depends on what you mean by death, or, to put it another way, on how dead the victim is. If you say a person is dead the moment his heart has stopped its beating or he has stopped breathing, one or another of these methods may very well restore life to his body by starting the heart and lungs going again.

These methods do not always succeed, however, and their success or failure depends on what has happened to the rest of his body, particularly to his brain. If certain organs, such as the kidneys or liver, have become so broken down by disease that they cannot function, or if there is so much poison—either chemical or bacterial—in the body that it cannot be entirely eliminated, starting the heart and lung action will not be of any use.

Restoring life, however, is not merely a matter of starting the heart beating and the lungs breathing, as you may have supposed. It is a matter, also, of starting the brain functioning, getting the mental processes going once more. Science has not yet found a restorative for a dead brain, though it has many devices for priming the body's pump, the heart.

"If I had been shocked by an electric current, I would not want anyone to bring me back to life," declared an eminent physiologist. "For if I were resuscitated, the chances are my brain would not be functioning and I would be dead from the neck up."

The brain "dies" from starvation. It gets its nourishment from the blood constantly pumped to it by the heart. When the heart stops pumping for any length of time, the brain is deprived of nourishment and starves to death.

The whole matter of restoring life after death depends on how long the brain has been deprived of nourishment. That is why, when you try to revive the victim of a drowning accident or an electric shock, you must start resuscitation at once without even waiting for a doctor.

No one knows yet how long the brain can be completely deprived of blood supply and still be revived. Possibly not more than ten or fifteen minutes. But the exact limit has not been determined, although physiologists have given this problem some attention.

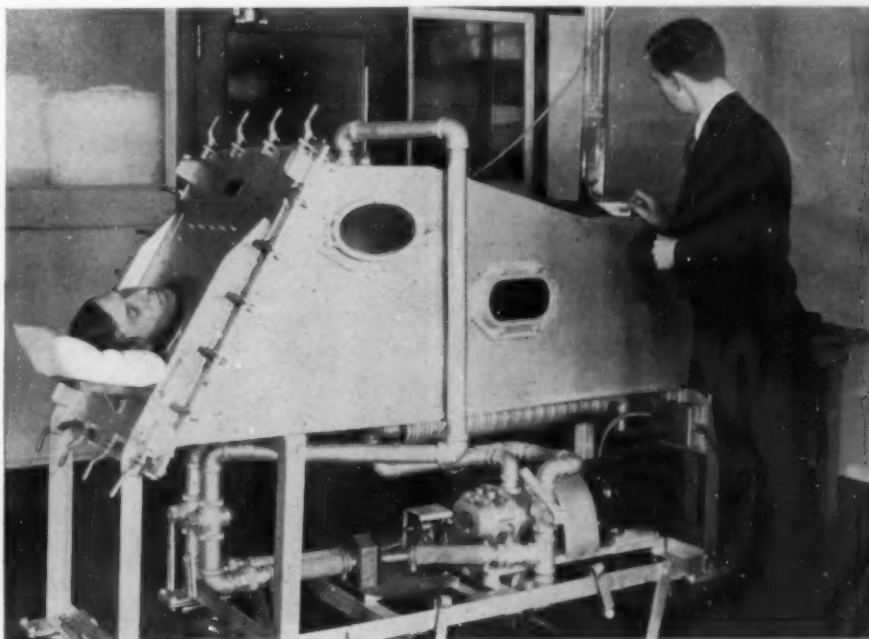
This was the crux of the experiments carried on at the University of California by Dr. Robert E. Cornish, whose revivals of dogs that had been put to death has attracted nation-wide interest. Dr. Cornish and associates succeeded in starting the heart and circulation in these animals by methods commonly and often successfully used to revive victims of accidents or dying patients. As a result, the animals' bodies came to life. But their brains, according to early reports, failed to function properly.

These had apparently been too long deprived of nourishment.

Physiologists, hearing of Dr. Cornish's investigations, hoped that they would shed light on the question of how long the brain could be starved without being irrevocably damaged. But they do not yet feel that the question has been fully answered. One of the dogs is said to have barked and eaten food, even to have recognized certain voices and signals. Its brain, however, was not restored to completely normal functioning; the dog may never be more than a half-wit.

Failure to restore life to accident victims is usually due to the fact that too much time has elapsed after apparent death occurred. Even if improved methods of resuscitation could start heart action and breathing in victims dead for any length of time, physiologists suggest that such success might be anything but a kindness to the victim or his family.

Scientists working at the Johns Hopkins University, however, have found a way around this difficulty under certain conditions of death. Animal victims of electric shock from a low voltage current, such as is car- (Turn to Page 346)



MAN'S BATTLE AGAINST DEATH

—finds a capable ally in the Drinker respirator, a machine which carries on artificial respiration tirelessly.

FORESTRY—CLIMATOLOGY

# The Doctors Dispute About Trees

**Climate Will be Affected Only Locally, But Trees Are Expected to Make West a Better Place to Live**

**T**HE MUCH-debated shelter belt of trees proposed for the Great Plains region would be at best of minor usefulness, and when most needed would be of no use at all, in the opinion of Dr. Ellsworth Huntington, research associate in geography at Yale University. In *The Journal of Forestry* (November), Dr. Huntington sets forth his reasons for skepticism at some length.

He expects no general effect on the climate at all. Meteorologists are practically unanimous, he declares, in believing that any effect which a tree belt might have upon the rainfall would be negligible.

But further than this, Dr. Huntington holds that the local and limited reductions in evaporation rates immediately in the lee of a tree belt could not operate to advantage under some of the most critical drought conditions, simply because there would not be any water in the soil to be conserved by this check on evaporation.

He says: "Even if a tree belt could be established, it would be of little value in two kinds of bad seasons, namely, those experiencing droughts in the cooler months when the wheat is germinating and making its early growth, and the deadly years when rain is deficient during the spring before the arrival of great heat.

"Corn profits from the shelter of trees more than does wheat, because its main growing period is in hot weather, but corn is far less important than wheat in the Shelter Belt.

"The net result, then, is that even if a Shelter Belt were established its effect would be important chiefly in years when the precipitation of the cooler season insures a good early growth of the crops before hot weather sets in."

It would be more to the point, Dr. Huntington thinks, frankly to abandon the idea of grain farming in this region and restore it to its original state as a grassland cattle range, fencing off certain areas for wild hay harvesting, to be stored against recurring lean years, and also providing for better water supply by deep wells and storage reservoirs.

Even better, he holds, would be a

thorough-going program of Government-supported research aiming at long-range weather forecasts that might tell in what seasons it would be safe to plow and plant, and when a timely retreat should be made before an oncoming drought.

He suggested: "Probably no scientific discovery would benefit American farmers more than would the ability to predict the general character of the weather six months or so in advance. Many helpful lines of investigation are known, but the great hindrance is lack of funds and workers.

"The Weather Bureau ought to have half a million dollars per year—only ten million dollars of capital investment—with which to employ skilled men for research only. Today even the best research men there devote a large part of their time to routine administrative work with which they never ought to be bothered.

"Instead of a Shelter Belt why not discover when to plant marginal lands and when to refrain from planting?"

Forestry as a profession may suffer from the intensive publicity which the tree-belt project for the Plains area has received, Prof. H. H. Chapman of the

Yale School of Forestry fears (*Journal of Forestry*, November). Prof. Chapman is also president of the Society of American Foresters.

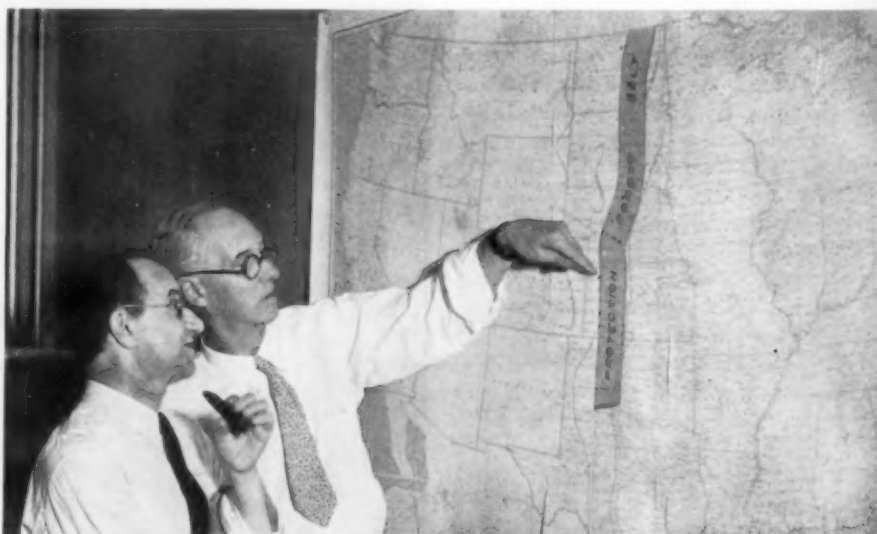
Foresters have been handicapped for a long time, he says, by skepticism on the part of other professions regarding the soundness of their scientific standing. Now, just as their colleagues are becoming favorably convinced "comes this sudden front page publicity, reviving all the old misguided notions of forests and climate."

Prof. Chapman points out the possibilities and limitations of tree-growing in the Great Plains region:

"As outlined in its rigid simplicity, of 100 continuous belts of trees 1,000 miles long, the plan is fantastically impossible. . . . On heavy clay soils, or on alkaline areas, no success can be expected even with the utmost care. Where the soil permits of tree growth the rate of height growth is slow and the trees are relatively shortlived. . . .

"Yet trees can be grown on these plains, provided the entire operation is guided from first to last by the highest technical skill in selecting site, species, seed sources, planting methods, cultivation and continuous care, rejecting all chances on which the odds are unfavorable, and disregarding the relatively very high costs of the operation.

"Not only that, but the localities



## PLANS AND POSSIBILITIES

Dr. Rafael Zon, director of the Lake States Experiment Station of the U. S. Forest Service, discusses shelter belt problems with a colleague.





#### ALREADY ON GUARD

*A farm shelter belt of Scotch pine in Minnehaha County, S. D., only a few scores of miles to the eastward of the proposed Great Plains shelter belt location, seems to be doing very well.*

which produce these trees are made better places for human beings to live in. The immediate lee of the windbreak is given distinctly beneficial protection from the velocities and evaporation of strong hot winds, or stinging northers. Frequent hedges and tree belts (every few hundred feet) are used with good effects in forest nurseries and elsewhere to control blowing sands."

In North Dakota, where the proposed Great Plains shelter belt would begin, the doctors are disagreeing, both as to its practicability and its value. A symposium published in *American Forests* (November) sets forth some of their pros and cons.

Prof. C. B. Waldron of North Dakota Agricultural College, Fargo, states:

"Until the last few years of severe drought it was our belief that on any land where farmers could grow crops, groves of trees could be established if the right species and methods were used. Now that we have witnessed a rapid decline in the condition of both natural and artificial timber tracts, we realize that nothing can overcome very adverse natural conditions. . . .

"Trees can be grown to an age of twenty to thirty years without great difficulty in most situations, but after that, their greater requirement for moisture means a slowing up of growth or an actual decline in unfavorable conditions or in very dry years. Under any but the most favorable conditions, due to natural soil moisture, the groves of North Dakota have not improved after forty

years and at the end of fifty years, most of them are gone."

George F. Will, a prominent nurseryman of Bismarck, N. D., who has had wide experience in tree planting in the Plains region, believes that the undertaking is doomed to failure if carried through along the lines announced.

He writes: "I feel quite sure that as originally announced and outlined the shelter belt can be nothing but a failure as a whole. There are a very large number of acres throughout the territory which, owing to elevation, drainage or soil conditions and content, cannot under any circumstances support a growth of trees, and many portions of the shelter belt are bound to cross such areas.

"It seems to me, therefore, that if a project of this kind is going to be put through at all it will necessitate a rearrangement by which selected areas scattered over the whole project area and picked for their adaptability to tree growing should be planted and the continuity of the belts forgotten."

On the other hand, Pres. F. E. Cobb of the North Dakota School of Forestry, gives the project wholehearted endorsement, though with cautions that replacement plantings should be planned at shorter intervals than is customary in Eastern forestry practice, and with solid doubts regarding any wholesale effects on climate.

"As to the technical soundness of this large federal project, I would unquestionably state that it is entirely sound and with the proper species of trees and

previous preparation followed by subsequent cultivation and supervision should give a high degree of success. . . .

"Even during these last five years of drought in North Dakota our plantings have been uniformly successful, where the land had been properly prepared the summer previous to spring planting and had received the proper subsequent cultivation."

While foresters, climatologists, land economists and other experts of all varieties continue to debate the possibility of growing trees on the Great Plains, and their value if they can be grown, the U. S. Forest Service is actively engaged in the preliminary steps of actually finding out. Comptroller General McCarl's ruling, that stopped the immediate expenditure of \$15,000,000 for full-scale planting, still left \$1,000,000 available, and this is to be expended in surveys, experimental plantings, and the development of the large nursery stocks of young trees that will be needed if Congressional action this winter restores the plan to its full scale, with funds to go ahead.

Administrative offices for the shelter belt project have been opened at Lincoln, Nebr. In St. Paul, Minn., research men of the Lake State Forest Experiment Station are attacking the botanical and ecological problems.

Of native American trees, the species on the testing list are for the most part chosen from among the last outliers of the prairie groves and timber belts that look westward toward the almost treeless expanse of the Plains. They include such inhabitants of dry hilltops as burr oak, hackberry, red cedar and jack pine. Soft or silver maple and boxelder, two native tree species that used to be planted in millions by the early generations of farmers on the prairie hills, will also be given a try, as well as American elm, green ash, white birch, poplar and ponderosa pine.

Foreign trees also are scheduled for testing. The same dry interior steppes and plains, from eastern Russia clear across Asia, that yielded such now-familiar drought-resistant crops as alfalfa, Siberian millet and the hard wheats, have also been combed for drought-resisting trees. Five species now in hand are considered promising, on the basis of experience already had in this country. They are Russian willow, Russian olive, Russian mulberry, Chinese elm and the Golden Rain Tree.

## ASTRONOMY

## Earth Has Lost Leonid Meteor Stream

THE earth has lost touch with the densest part of the Leonid meteor swarm which astronomers had confidently expected to see as "shooting stars" recently.

Prof. Charles P. Olivier, director of the University of Pennsylvania's Flower Observatory and also president of the American Meteor Society, has come to this conclusion after observations made under ideal conditions for four consecutive nights beginning Nov. 13-14.

Instead of an unusual number of Leonids, never more than 11 meteors, eight of which were Leonids, were seen by a single observer in one hour. Few of the Leonids were bright, none were remarkable, and no long-enduring trains were left. Prof. Olivier in 1901 observed Leonids 15 times as numerous.

Prof. Olivier believes that the Leonid meteor-causing part of a stream of comet fragments has shifted sideways, taking it out of the path of the earth.

"It will be almost impossible as the 1960 cycle approaches," Prof. Olivier said, "to make any definite predictions, as the erratic behavior of the stream in the 1928-1934 cycle shows we have lost all touch with the densest group. There is, however, not the slightest reason to interpret this as a consequence of the actual partial dispersion of the stream, or to lose hope that in future the densest group may not again intersect the earth's orbit and give equally fine showers with those seen in past centuries."

*Science News Letter, December 1, 1934*

## PUBLIC HEALTH

## Encephalitis Outbreak Possible Anywhere in U. S.

AN encephalitis outbreak of the type that occurred in St. Louis and vicinity last year may appear anywhere in the United States at any time, studies conducted by the U. S. Public Health Service show.

The virus that causes this disease is pretty well distributed throughout the country, the federal health experts find. When, where and why this low level of infection will flare up into another serious epidemic is not known. The government's disease fighters, however, are trying to discover what factors deter-

mine when an outbreak takes place. Many suggestions have been made, but at present these cautious, thoroughgoing men of science are unwilling to give even an opinion.

They have already devised a test which gives a pretty good though not an absolute indication of whether or not a person has been infected with the virus of St. Louis encephalitis, as this type of the disease has come to be known.

Numerous healthy carriers of the disease have been detected by this test, Dr. J. G. Wooley of the U. S. Public Health Service's National Institute of Health reported to the Washington branch of the Society of American Bacteriologists. Dr. Wooley reported studies made by himself and two other U.S.P.H.S. officers, Drs. Charles Armstrong and R. D. Lillie.

People who were in contact with cases in the St. Louis epidemic last year but who did not suffer an attack of the disease more frequently have immunity or resistance to it than the population at large, Dr. Wooley finds.

The disease probably invades the body through the nose and is therefore spread much the same as a common cold or influenza is spread.

*Science News Letter, December 1, 1934*

## ASTRONOMY

## Host of Variable Stars Reported by Astronomer

SEVENTEEN hundred hitherto unreported variable stars, 1,000 in the Small Magellanic Cloud and 700 in our own Milky Way galaxy, were reported by Prof. Harlow Shapley, director of the Harvard College Observatory, in one of his periodic comprehensive reports on the astronomical state of the universe as seen through telescopes. Prof. Shapley spoke before the meeting of the National Academy of Sciences at Cleveland. The newly located stars will give us a better idea of the great aggregations of the star-studded nebulae that dot space as far as telescopes can reach.

In addition, thousands of faint and remote galaxies, each a cloud of thousands of stars, have been discovered, Prof. Shapley reported. The Harvard census of new faint galaxies now totals 125,000, with about a third of the sky covered and only galaxies lying between about fifty and a hundred and fifty million light years away included.

*Science News Letter, December 1, 1934*

# IN SCIENCE

## PHYSIOLOGY

## High Blood Pressure Cause Of Thickening of Arteries

HIGH blood pressure brings on the dreaded thickening of the arteries that afflicts so many and takes such a death toll these days. It is not the other way around, as some medical investigators have believed. Dr. Alan R. Moritz of Western Reserve University has made this discovery in careful and laborious microscopic tests upon 72 individuals, half of whom came to the post-mortem table with records of high blood pressure, heart damage, and kidney disease, while the other half had no such trouble.

To the National Academy of Sciences, Dr. Moritz explained that researches into the ultimate cause or causes of hypertension, as doctors call persistent high blood pressure, will be directed and executed with greater precision and hope of success if it is known that thickening of artery walls is the effect and not the cause of the high blood pressure. His view that high blood pressure is the horse and the artery condition the cart is supported by the fact that although thickening of the arterioles, or tiny arteries, was characteristic of the high pressure group, it was not present in all individuals who were known to have had long-standing high blood pressure.

*Science News Letter, December 1, 1934*

## ASTRONOMY

## Lick Observatory To Have New Photo Telescope

PHOTOGRAPHING stars will be made much more rapid and accurate by a new wide-angle photographic telescope soon to be constructed for the Lick Observatory at Mount Hamilton. As yet, only preliminary plans are in hand, and details of either lens type or mounting are not yet available, Director R. G. Aitken stated.

Funds for the construction of the instrument have been donated by the Carnegie Corporation of New York.

*Science News Letter, December 1, 1934*



# SCIENCE FIELDS

## PHYSIOLOGY

### Negroes' Brains 10 Per Cent. Lighter Than White Men's

**N**EGROES' brains average about ten per cent. lighter than the brains of white men, a recent statistical study by Prof. Raymond Pearl of the Johns Hopkins University tends to indicate (*Science*, Nov. 9).

Measurements of Negroes' cranial contents, and weights of Negroes' brains, have been recorded by various investigators over a long period of years. Prof. Pearl reviewed these researches, and treated the figures recorded by modern statistical methods, as far as seemed practicable.

Among the points brought out in his summary is the following: "The mean brain weight for the black series is 92.1 per cent. of that for the white series. The approximate agreement of this with Morton's, Peacock's, Duckworth's and Vint's results is clear, and may reasonably be taken to lead to the conclusion that the Negro brain is, on the average, from 8 to 10 per cent. lighter than the fairly comparable white brain."

*Science News Letter*, December 1, 1934

## ASTRONOMY

### Suns in Swarms Pass Through Each Other's Ranks

**O**UR sun, with a great swarm of its sister stars, is swimming through the emptiness of space in one direction, while at the same time we are in the midst of another group of stars that is passing us, apparently going in another direction. This other group is known as the Ursa Major group, because the first recognized stars in it are members of the familiar constellation known as the Great Dipper. The two groups interpenetrate each other's ranks like schools of fish that mix without collision, each holding to its own course.

Advances in our knowledge of this stellar traffic problem were outlined before the meeting of the National Academy of Sciences, by Prof. J. J. Nassau

and L. J. Henyey of the Warner and Swasey Observatory, the Case School of Applied Science.

"The unusual fact about the Ursa Major Group is that our own sun happens to be near the center of it and does not partake in the motion of the group," said Prof. Nassau. "In other words, the 126 stars finally accepted as forming the group move uninterrupted amongst the stars in the neighborhood of our sun; much like a school of fish moving through another school."

"Although the group passes the sun with a speed of about 10 miles a second, it will take some 2,600,000 years for our sun to be left outside the group. The fact that the stars of the group are moving becomes apparent in a relatively short interval of time; for example, the shape of the Dipper will be totally unrecognizable within 50,000 years."

"The stars in the cluster are more massive than our sun. Half of the stars are white with some yellow and a few red. Our sun is a yellow star. The blue stars are conspicuously absent from the group."

*Science News Letter*, December 1, 1934

## PUBLIC HEALTH

### Fight Against Smallpox Not Yet Entirely Won

**T**HE fight against smallpox has not yet been entirely won.

Statisticians of the Metropolitan Life Insurance Company make this statement in spite of the fact that their figures show there was less of this dread disease in the United States and Canada in 1933 than ever before and that the records for the first seven months of 1934 promise a further drop in the number of smallpox cases.

Significant is the fact that fully three-fourths of the smallpox cases reported by American states in 1933 occurred in only 12 states whose population is only one-fifth of that of the entire country.

"Generally speaking, these states are the ones in which popular sentiment has been most opposed to compulsory vaccination," the statisticians point out.

The twelve states are California, Colorado, Idaho, Iowa, Montana, Nevada, Oklahoma, Oregon, Texas, Utah, Washington and Wisconsin. Falling in the same class of above-average prevalence of smallpox during 1933 was the Canadian province of Saskatchewan.

*Science News Letter*, December 1, 1934

## MEDICINE

### Leprosy May Enter Body Through Nose or Skin

**H**OW does the leprosy bacillus get into the human body? If scientists knew the answer to that question, they might be well on their way to victory over a disease that has inspired horror and despair since Biblical times.

A group of Uncle Sam's disease fighters in far-away Hawaii are investigating the possibility that the "germ" that causes leprosy enters the body through the membranes that line the nose, which is the way the infantile paralysis virus gets into the body. It is not practical and would, indeed, hardly be possible to prove this directly, Dr. N. E. Wayson, in charge of the leprosy investigations, points out. So, following established scientific custom, he and his associates are investigating the possibilities of rat leprosy being transmitted via the nose.

They find that when they put a suitable number of leprosy bacilli into the nose of a rat, the neighboring lymph glands become infected and the infection spreads throughout the animal's body, producing the changes of skin and internal organs typical of the disease. Injecting material from leprosy sores into the tissues of the face about the nose of the animal also is followed by a generalized spread of the infection in a large percentage of cases, although such injections into superficial tissues elsewhere on the body rarely produce a wide spread of the infection within a comparable length of time.

These results support the theory that leprosy enters the body through the nose.

This may be only one of its ways of getting into the body, however. Further investigations showed that when leprosy material is inoculated at any place on the body, the bacilli get into the blood even though the body tissues do not show any signs of the infection. Subsequent alteration of the tissues, the exact nature of which is not known, results in development of leprosy sores at the place where the material was inoculated.

These findings in rat leprosy may be of important significance, Dr. Wayson points out, as indicators of the manner of invasion of human leprosy in man and of how the disease starts after the infecting organism has entered the body.

*Science News Letter*, December 1, 1934

## From Page 341

ried on the ordinary household wires, may be restored to life if a stronger counter-shock is applied to the heart within a few minutes of death. The discovery was made by Drs. William B. Kouwenhoven, Donald R. Hooker and Orthello B. Langworthy.

The success of the countershock depends on the effects of the first shock and on what it has done to the victim's heart.

### Low Voltage Dangerous

A shock from a low voltage current is much more dangerous than a shock from a high voltage wire because it is more likely to cause a peculiar condition of the heart known as fibrillation.

Ordinarily the many muscle fibers of the heart all contract together in regular rhythm to pump the blood out into the arteries which carry it around the body. In fibrillation the muscle fibers act as individual units and the result is a useless twittering and quivering instead of a strong contraction. When the heart gets the jitters this way it fails entirely to pump blood out to the rest of the body.

It is for this condition that a strong counter shock is a successful treatment.

The counter shock, if applied within a few minutes, will stop the fibrillation and give the heart a chance to resume its normal beat, the Johns Hopkins investigators found. If it can be given quickly, before the brain has been too long deprived of nourishment, the victim may be restored to life.

The discovery of this treatment is particularly promising because when the heart is fibrillating artificial respiration, the usual method of reviving victims of electric shock, is probably ineffective.

Victims of high voltage shock whose hearts stopped beating without fibrillation might lose their last chance of recovery if treated by electrical counter-shock. But in some cases they may be restored by artificial respiration, which is one of the most important of all methods of restoring life. Artificial respiration by the prone pressure method is so simple that a child can do it, and so vitally important in cases of drowning or gas poisoning as well as some kinds of electric shock that everyone should know how to do it.

### Alternate Pressure

The method consists, essentially, of alternately compressing the chest and releasing the pressure, thus causing the air to flow in and out of the lungs. A

number of methods of doing this have been tried. One of them is to place the victim on a see-saw or teeter-totter. Tilting the body back and forth in this way forces the diaphragm—the large muscle dividing the chest from the abdomen—to compress the lungs and then to allow them to expand and suck in air. This method is reported to be one of the devices used by Dr. Cornish in reviving his dogs.

Considered the safest and most efficient method of artificial respiration, however, is the prone pressure method devised by the eminent British scientist, Sir Edward Sharpey-Schäfer, in 1903. You have probably heard or read dramatic stories of persons being restored to life after this type of artificial respiration had been carried on for many hours.

In some cases of illness, notably infantile paralysis, the muscles used in breathing are paralyzed and the patient can only be kept alive by having someone else keep his lungs expanding and contracting. Sometimes this is done by the prone pressure method of artificial respiration, relays of relatives and friends taking turns. For use in such cases, a young engineer at Harvard School of Public Health, Philip Drinker, designed an apparatus called a respirator which replaces the manual operation of artificial respiration. The patient is placed inside the respirator with only his head outside. The pressure of air inside the tank is alternately increased and decreased and this change in pressure forces the lungs to expand and contract, just as the manual or prone pressure method does, and with every expansion air is sucked into the lungs, to be forced out with every contraction as in normal breathing.

### Pulmotor Also Aids

After some accidents, particularly gas poisoning, a pulmotor is used with artificial respiration by the prone pressure method. The patient then gets oxygen or a mixture of oxygen and carbon dioxide sucked into his lungs with every artificial breath.

Artificial respiration restores life by first starting the breathing again. Other methods have been devised to restore life by first starting the heart beating again. One of these is an electric needle which is thrust between the ribs and directly into the heart. This device was invented by Dr. Albert S. Hyman of New York City. It takes advantage of the fact that the heart has a natural pace-maker, a spot where its contraction is started and which is connected with

### DIRECTIONS FOR ARTIFICIAL RESPIRATION

1. Start immediately; don't stop to move patient, loosen clothing or anything else.
2. Send some one else for a physician.
3. Lay patient on his belly, one arm extended directly overhead, the other arm bent at elbow.
4. See that the nose and mouth are free for breathing. The patient's face should be turned outward and should rest on one hand and forearm.
5. If you can quickly open his mouth, feel in it and in his throat with your fingers to locate and remove any foreign object, such as chewing gum, tobacco or false teeth, that might get back into the wind pipe and obstruct the passage of air.
6. Kneel straddling the patient's thighs. Place the palms of your hands on the small of his back with your fingers resting on his ribs. Your little fingers should just touch the lowest rib, the thumbs and other fingers in a natural position.
7. Hold your arms straight without bending the elbows and swing forward slowly so that the weight of your body is gradually brought to bear on the patient. Your shoulder should be directly over the heel of your hand at the elbow at the end of the forward swing. This operation should take about two seconds.
8. Now immediately swing backward so as to remove the pressure.
9. Wait two seconds and then swing forward again.
10. Repeat these two movements unhurriedly and rhythmically twelve to fifteen times a minute. A complete respiration—breathing in and out—should take four or five seconds.
11. Keep this up without interruption until natural breathing is restored—if necessary for four hours or longer or until a physician declares the patient dead.
12. As soon as you have started artificial respiration and while you are keeping it up, let someone else loosen any tight clothing about the patient's neck, chest or waist.
13. Keep the patient warm but do not give any liquids by mouth until he has fully recovered.
14. If it is necessary to have someone relieve you at artificial respiration, make the change without losing the rhythm.
15. Watch the patient after natural breathing has started and if it stops after a short time, as often happens, be ready to resume artificial respiration at once.



## TO A PIONEER

The historic hill in suburban Berlin where Otto Lilienthal made his pioneer glider flights is now marked by this unique monument commemorating his 1896 flights on the site. The low hill at Lichterfelds—really little more than a mound—is the mecca of aviation enthusiasts who visit Germany's capital. There, they see the great metal globe of the world resting on a marble base. The names of celebrated aviators and their historic flights are engraved on the sphere. Round-the-world flights, flights across ocean, deserts, and the poles are recorded for posterity.

those parts of the brain and nervous system which have to do with regulating the heart beat. Dr. Hyman's device is called the artificial pace-maker.

The needle is stuck into the heart close to the natural pace-maker and a weak electric shock is sent through it into the heart at regular intervals, say forty or more to the minute. Each shock starts a contraction of the heart just as the natural pace-maker would. If there is nothing permanently wrong with the heart, its own pace-maker may recover and take up its job again and the heart will go on beating naturally and the patient be restored to life.

An older method of reviving a stopped heart is by massage. The surgeon opens the chest of the apparently lifeless patient and massages the heart at the same time that oxygen is being given by artificial respiration. In reporting the heart massage method of reviving lifeless patients, Prof. O. Bruns of the University of Königsburg, Germany, credits his success with the method more to the artificial respiration with oxygen than to the heart massage.

Other methods of starting the heart make use of chemical stimulants. Chief among these is adrenalin, the potent hormone produced by the medulla or inner part of the adrenal glands. In extreme cases, this is injected directly into

the heart. Generally it is injected into a vein of a dying patient, and is carried back to the heart by the blood stream. Camphor and strychnine are other, less potent heart stimulants.

A heart may stop beating and life ebb away when there has been severe hemorrhage. In such cases, the physician will resort to blood transfusion to give the heart something to pump. In Russia a method has recently been found for using the blood of accident victims who could not be resuscitated to restore life to other patients about to die from lack of blood.

The scientists who discovered the value of counter-shock for reviving victims of electric shock hope to find a way of making it practical for use on linemen and others working with electricity who are most exposed to its dangers. Artificial respiration can be used by any layman who learns it.

Science News Letter, December 1, 1934

## MEMORANDUM ABOUT CHRISTMAS:

What a friendly thing it is to say "MERRY CHRISTMAS."

We all say it in many ways—with gifts of as many kinds as there are personalities to be given to, as well as to give.

Some of you who will read this note used one or several subscriptions to Science News Letter last year, to remember friends and relatives.

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Watson Davis

WD/TR

Editor.

P. S. If you would like us to send you a Red and Silver Parchment Christmas Greeting folder to pass along to announce your gift, please make a notation to that effect on the order form.



# •First Glances at New Books

Additional Reviews  
On Page 352

## Physiology

**THE CIRCULATION OF THE BLOOD**—Winifred Parsons—*Macmillan*, 204 p., \$1.75. What has been learned, since the days of the great Harvey, about the circulation of blood in man and other animals; something about how the knowledge was gained; and its significance in terms of health and disease are here presented briefly and fairly simply for the layman. Some of the numerous illustrations seem a little technical for the general reader, but most of them will prove helpful.

*Science News Letter, December 1, 1934*

## Education

**EDUCATION AND SOCIAL PROGRESS**—Charles H. Judd—*Harcourt, Brace*, 285 p., \$2.00. The head of the department of education at the University of Chicago here emphasizes the fact that Americans want more than an eighth-grade education, indeed that the American people worship intellectual achievement. But more than the ideal is needed. Dr. Judd points to some practical ways in which the ideal must be given reality.

*Science News Letter, December 1, 1934*

## Agricultural Economics

**FIRST PRINCIPLES OF COOPERATION IN BUYING AND SELLING IN AGRICULTURE**—Elmer O. Fippin—*Garrett and Massie*, 320 p., \$2.50. The first merchant who ever appeared in the world doubtless was resented by both producers, for paying them too little, and by

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consumers, for charging them too much. Since then, the "middleman problem" has always been with us. Many have wished to eliminate or at least abate the middleman, but until the birth of the modern cooperative movement there have been few who would undertake to bell this particular cat. The present volume tells persuasively and in considerable detail how to go about establishing agricultural cooperatives, and in equal detail how to keep them out of the many difficulties that beset them.

*Science News Letter, December 1, 1934*

## Psychology

**CAN ATTITUDES BE TAUGHT?**—Arthur Lichtenstein—*Johns Hopkins Press*, 89 p., \$1.25. The answer found by means of the research reported is "yes and no." "The schools seem able to increase resistance to superstitions by stressing open-mindedness. They do not seem able effectively to decrease prejudice or to increase scientificity by the same means."

*Science News Letter, December 1, 1934*

## Technology

**SYMPOSIUM ON THE OUTDOOR WEATHERING OF METALS AND METALLIC COATINGS**—*American Society for Testing Materials*, 113 p., \$1.25 paper, \$1.50 cloth.

*Science News Letter, December 1, 1934*

## History—Ethnology

**THE FIVE CIVILIZED TRIBES**—Grant Foreman—*University of Oklahoma Press*, 455 p., \$4. Five tribes of Indians were among the pioneers who settled the West. These southeastern aborigines, forced to migrate across the Mississippi, played their part in the development of what is now Oklahoma. The story of their trials and achievements is told in this eighth volume in the Civilization of the American Indian Series.

*Science News Letter, December 1, 1934*

## VITALISM and MECHANISM

### A DISCUSSION

between

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and  
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## Mechanics

**MECHANICS FOR BEGINNERS**—F. Barraclough and E. J. Holmyard—*Dutton*, 214 p., \$1. With simplicity and effectiveness this book presents material on forces, work and machines, density, specific gravity, liquid pressure, gases, speed, the laws of motion and energy. Beginners have a good chance of finding themselves enjoying this branch of physics because of the way in which applications and relatively current happenings are mingled with history and the solid and more technical physics. The authors are two British teachers.

*Science News Letter, December 1, 1934*

## Zoology

**THE MOOSE OF ISLE ROYALE**—Adolph Murie—*University of Michigan*, 44 p., VII plates, 70c. The moose of this Lake Superior island, under discussion as a possible new National Park, are at present presenting something of a Malthusian problem; causal factors and possible solutions are here discussed, in addition to a good presentation of their general natural history.

*Science News Letter, December 1, 1934*

## Radio

**SHORT WAVE RADIO HANDBOOK**—C. E. Denton—*Radio and Technical Publishing Co.*, 127 p., \$1.00.

*Science News Letter, December 1, 1934*

## Plant Physiology

**LETHAL RESPONSE OF THE ALGA CHLORELLA VULGARIS TO ULTRAVIOLET RAYS**—Florence E. Meier—*Smithsonian Institution*, 12 p., 3 pl., 15c. An important contribution to our more accurate knowledge of the effects of radiation on plant life.

*Science News Letter, December 1, 1934*

## Conservation

**SECOND REPORT OF THE DIRECTOR OF EMERGENCY CONSERVATION WORK**—Robert Fechner—*Govt. Print Off.*, 50 p., 4 folded tables, 10c. Scientific and engineering agencies of the Federal Government benefiting by the work of this organization include: Forest Service, U. S. National Park Service, Bureau of Indian Affairs, Office of Chief of Engineers, Bureau of Biological Survey, and Bureau of Animal Industry. The report covers the period from April 5, 1933, to March 31, 1934.

*Science News Letter, December 1, 1934*

## From Page 339

ton's laws and closer to observations than Einstein's prediction of twice the angle derived by Newton's mechanics.

The shift of the Fraunhofer lines in the sun's spectrum is predicted closer by Sir Shah's theory than by Prof. Einstein. The shift comes out to one-half that predicted by relativity.

Moreover, both velocities of recession and approach are permissible for nebulae so that the universe is stable and not necessarily expanding.

Discussing the principles of Newton and those of Einstein Sir Shah says:

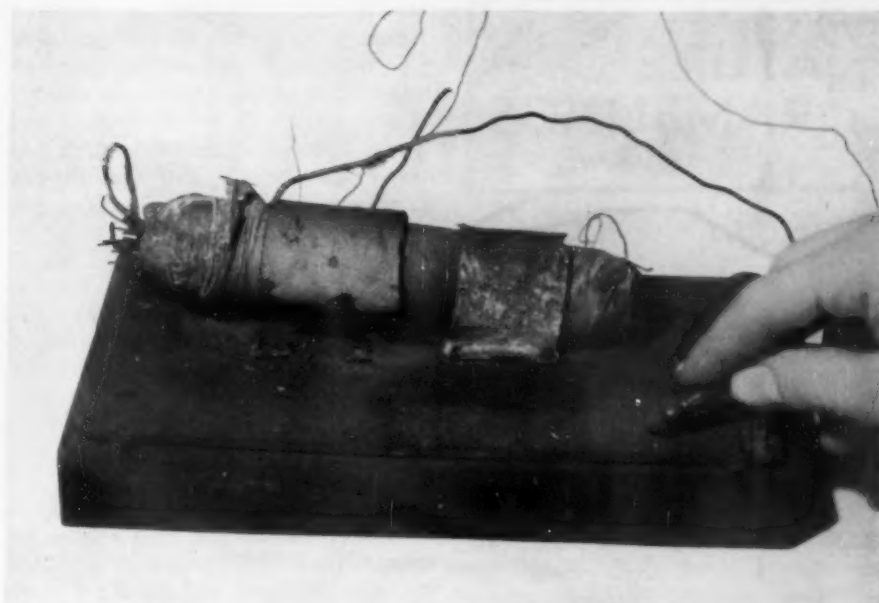
"Newton assumed that gravitation had an instantaneous effect, however, distant the object might be. This implied that its velocity was infinite. He further assumed that the same law of gravitation applied between two bodies, whether they were at rest or in relative motion. Later observations showed that his law was inaccurate for moving bodies.

"Einstein has given a slightly more accurate law, but at the complete sacrifice of the principles of Newton. Relativity denies the absoluteness of space, time and motion, but can hardly deny the absoluteness of angular motion or sudden change of motion.

"When a boy spins a top, does he give an absolute rotational motion to the top or does he set the entire universe revolving round the top in the opposite direction?" asks the Indian mathematician.

"Or again," he adds, "when a motorist suddenly puts on his brakes, does he stop his car or does he push the whole universe on a backward path?"

"Relativity makes the velocity of light absolute, and although it is a known finite velocity (300,000 kilometers a second), the properties of infinity are attributed to it; and no velocity, howsoever great, when added to it or subtracted from it, can ever make any difference.



## DID JOSEPH HENRY MAKE THIS APPARATUS?

*Princeton University has been given the crude induction coil shown above as a gift from the estate of Dr. John MacLean, president of the University from 1854 to 1868. It is believed to have been made by Joseph Henry, American rival of Michael Faraday in the field of electricity.*

"Relativity makes space finite, and yet makes its finite limit incapable of being reached except in infinite time, by making time itself slow down with distance, and ultimately become stationary."

It is to circumvent such extraordinary conditions that Sir Shah developed his new theory, which is based on more reasonable grounds and yet predicts phenomena equally as well or even better than Einstein's relativity.

It is common knowledge that many scientists have accepted relativity only because of what it would do and not because they agreed with some of the radical fundamental assumptions.

*Science News Letter, December 1, 1934*

## PHYSICS

## Princeton Receives Coil Said to Be Joseph Henry's

**A**N induction coil of crude design and workmanship, presented to Princeton University by the estate of Dr. John MacLean, president of the university from 1854 to 1868, has aroused great interest in the physics department because of the likelihood that it was made and used by Joseph Henry, renowned American physicist who taught and experimented at Princeton from 1832 to 1848.

Henry was one of the foremost electrical experimenters of his day, observ-

ing induced currents as early as 1830, although he failed to publish any account of his work until after Michael Faraday's epoch-making announcement of the same discovery in 1832. The machine around which the present discussion centers is of such undoubted age that many are convinced that it belonged to Henry, whose memoirs describe several experiments which must have involved the use of a coil very similar to the newly discovered one.

*Science News Letter, December 1, 1934*

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## ● RADIO

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MITES, By Dr. Charles A. Kofoid,  
Professor of Zoology, University of Cali-  
fornia.

Tuesday, December 11, 4:30 p. m.  
CHRISTMAS TREES, By F. A. Silcox,  
Chief Forester, U. S. Forest Service.

In the Science Service series of radio ad-  
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ECOLOGY  
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*by Frank Thone*



**Trees West**

**O**UT OF the turmoil of debate over the projected Great Plains tree belt there seem to be emerging two rather general agreements, and two points on which experts still disagree. With relatively few exceptions, climatologists and plant scientists agree that a major modification of the climate east of the tree zone is not to be expected. But, they also agree, trees are good things in themselves, and if liberal plantings can be induced to grow on the Plains they will be well worth setting out, just to make living there "more human."

There is still disagreement on what benefits may be gained through local amelioration of climate over the fields in the immediate lee of the long strips of timber. That can be settled partly by studying "microclimatic" effects of other shelter belts already in existence farther east. A complete answer, however, must await the growing of the shelter belts on the Plains themselves, for even the best analogy is not an identity.

Further disagreement arises also over the question whether trees can be grown on the Plains at all. This again can be

settled conclusively only by actual experiment, such as the U. S. Forest Service is already undertaking. But for whatever value there may be in analogy, it may perhaps be worth while to look at the numerous tree species that now thrive on the originally scantily-timbered uplands of the true prairies now covered by the Corn Belt.

Here, extending from central Illinois across Iowa to eastern Nebraska and Kansas, farmers and townsfolk alike have made life more agreeable for themselves by cultivating not only native prairie lowland trees like elm, maple, oak and honey locust, but also many species from the much moister, "softer" climates of the Eastern United States and from Europe. Such Eastern trees as beech, chestnut and tulip-poplar get along very well in central Iowa. And all over the Corn Belt there are abundant plantings of moist-climate trees from the Old World, like European larch, English elm, Norway spruce, and

the ginkgo or maidenhair tree, from China and Japan. As a perhaps extreme case there might be cited bald cypress and one or two species of magnolia that have been grown successfully as far west as the eastern border of Kansas.

The point is that all these trees are getting along on the prairie uplands, with an annual rainfall from a fourth to a third less than that of their native regions, with summer droughts much more frequent and severe, and with winter winds and temperatures such as would be considered quite intolerable to them except that experience has proved the contrary.

It is not outside the scope of a moderate optimism to expect that if these "soft" trees have survived so far outside their native environments, then perhaps such tough prairie-edge species as burr oak, hackberry and green ash may manage to take hold and thrive after a rather shorter trek into the West.

*Science News Letter, December 1, 1934*

ARCHAEOLOGY

## Archaeologists Dig Where Jacob Dreamed of Angels

**T**HE earth at Bethel, where Jacob dreamed of angels and where King Jeroboam built a royal temple, is being probed for traces of historic events.

Nearly fifty baskets of potsherds—fragments of pitchers, wine jars, saucers, bowls and other dishes have been removed each day, on the average, in excavations this season.

Evidence of a great fire which effectively ended one stage of Bethel's career is one of the first discoveries reported to the American Schools of Oriental Research by Prof. W. F. Albright, director of the digging.

"Excavation has not progressed far enough," stated Prof. Albright, "to enable us to date this conflagration more precisely than between the seventh and sixth centuries B.C."

Traces of an earlier fire which destroyed the town some eleven to twelve centuries before Christ have also been discovered.

Among relics from various periods are coins of different rulers and nations, down to 69 A.D., the year in which Vespasian captured Bethel. No coins of later date have been found, though

walls, cellars, and grain pits of the Byzantine period have appeared.

Since an Arab village occupies part of the site of ancient Bethel, extensive exploration is hardly feasible, explained Prof. Albright. A fig orchard just north of the modern village has been rented, and it is in three sections of this orchard that the discoveries are being made.

Excavation of this Biblical site is a memorial to the late Prof. M. G. Kyle of Xenia Theological Seminary, who unearthed the ten-layered city of Kirjath Sepher shortly before his death.

*Science News Letter, December 1, 1934*

Raisin packers find that they can prevent the fruit from sticking together if they spray it with an oil made from the seeds of seeded raisins.

A species of orchid new to the Chicago region has been found near Pine, Indiana, and is pronounced one of the orchids known as "ladies' tresses."

By dusting grapevines with sulfur, agriculturists find that they can control powdery mildew, the most serious fungus disease of California vineyards.

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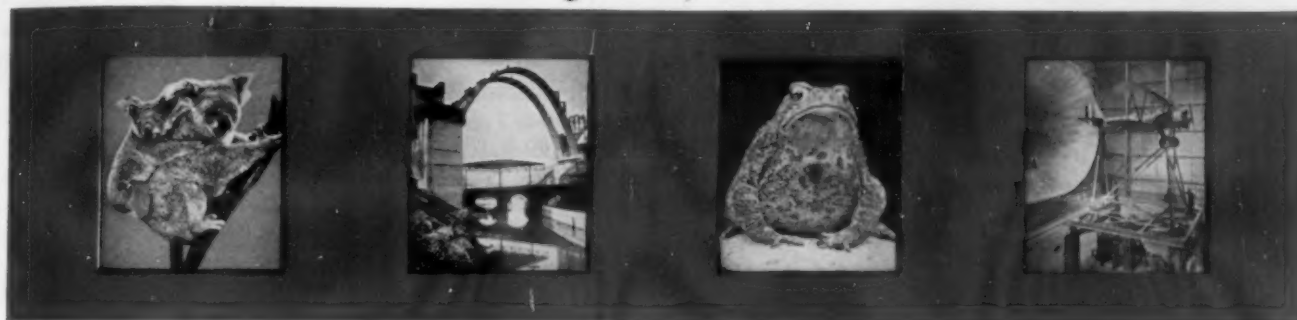
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# 47 Full-sized Pictures of subjects like these:



Note: The above pictures are greatly reduced. Each picture in the book, *Sciencepictures*, is four times as large.

Each picture has a 93- to 254-word description in language free from technical terms. No scientific reference library necessary! Gives information in words quickly grasped, and yet does not insult the intelligence of the scientifically trained mind.

# 15<sup>c</sup>

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## Mental Hygiene

**MENTAL HEALTH, PAST, PRESENT, AND FUTURE**—Arthur Hiler Ruggles—*Williams & Wilkins*, 104 p., \$1.50. In simple, effective words, Dr. Ruggles paints the picture of how man has coped with the ever-present problem of mental health and disease. In the last section he gives two practical suggestions for handling the problem in the future. This small volume is both interesting and stimulating.

*Science News Letter*, December 1, 1934

## Psychology

**EXECUTIVE ABILITY, ITS DISCOVERY AND DEVELOPMENT**—G. U. Cleeton and C. W. Mason—*Antioch Press*, 200 p., \$2.00. The authors, two psychologists, discuss a subject of great interest to the educator, vocational counselor, and the personnel administrator.

*Science News Letter*, December 1, 1934

## Sociology

**VOLUNTEER VALUES**—Comp. by Ruth M. Dodd—*Family Welfare Assn. of America*, 43 p., 30c. Helpful in making the contribution of the volunteer social worker a real help to the community.

*Science News Letter*, December 1, 1934

## Education

**COURTIS STANDARD RESEARCH TESTS**—S. A. Curtis—*Author*, 10c. for samples and explanatory statement. Achievements tests in arithmetic based on the principle of differential testing. How can we measure the child's ability to add as apart from his facility in reading and setting down figures? The answer provided by these tests is the expedient of measuring first his ability in simple copying, then in doing problems of addition. The difference between the scores in copying and in addition gives an index to the adding ability.

*Science News Letter*, December 1, 1934

## Genetics

**HEREDITY AND DISEASE**—Otto Mohr—*Norton*, 253 p., \$3.50. The principles of inheritance, both of normal traits and of disease, are explained carefully and fully in this excellent book. It is designed for the layman, though the author hopes it will also prove helpful to medical students and physicians. It will require but fully repay careful, thoughtful reading. Numerous illustrations help to clarify the complex subject. Perhaps a glossary of the many

scientific terms necessarily used would also be an aid to the lay reader, although the terms are explained in the text the first time they are used.

*Science News Letter*, December 1, 1934

## Physiology

**PHYSIOLOGY IN HEALTH AND DISEASE**—Carl J. Wiggers—*Lea & Febiger*, 1156 p., \$9. Written for medical students and physicians, the book seeks to give the physiological basis of disease and functional disturbances and at the same time to give an insight into the methods and procedures by which physiological knowledge is gained.

*Science News Letter*, December 1, 1934

## Natural History

**IN FIELD AND GARDEN: NATURE SCIENCE, BOOK IV**—Clyde Fisher and Marion L. Langham—*Noble and Noble*, 104 p., \$1. A carefully worked out nature reader for young students, with many illustrations, some in color.

*Science News Letter*, December 1, 1934

## Adult Education

**A STATE PLAN FOR ADULT EDUCATION**—Lyman Bryson—*American Association for Adult Education*, 69 p., 50c. (40c. to members.) Describing the activities of the California Association for Adult Education and other public and private agencies.

*Science News Letter*, December 1, 1934

## Education

**REPORT OF CONFERENCE ON SUPERVISED CORRESPONDENCE STUDY . . . HELD AT TEACHERS COLLEGE, COLUMBIA UNIVERSITY**—*International Textbook Co.*, 66 p., 25c. Of special interest to administrators of education.

*Science News Letter*, December 1, 1934

## Psychiatry

**OUTLINES FOR PSYCHIATRIC EXAMINATIONS**—Ed. by Clarence O. Cheney—*State Hospitals Press*, 134 p., \$1.50. A guide for psychiatrists, other physicians and medical students to follow in examining and obtaining the history of patients with mental disease. This is a revision of an earlier book edited by Dr. George H. Kirby and based on principles laid down by Dr. Adolph Meyer.

*Science News Letter*, December 1, 1934

## Child Psychology

**BIG PROBLEMS ON LITTLE SHOULDERS**—Carl Renz and Mildred Paul Renz—*Macmillan*, 129 p., \$1.50. The authors have gained the confidence of small patients and are thus able to provide a glimpse into the mind of the child who is trying to solve the perplexing problems of an adult world.

*Science News Letter*, December 1, 1934

## Teaching Methods

**ADVENTURES IN BIOLOGY**—Julius Schwartz and others—*New York Assoc. of Biology Teachers*, 59 p., 50c. This highly useful little pamphlet contains 286 study projects and a bibliography of 680 titles. Originally intended for use in New York City high schools, it can easily be adapted to fit practically any community in the country.

*Science News Letter*, December 1, 1934

## Physiology

**RECENT ADVANCES IN SEX AND REPRODUCTIVE PHYSIOLOGY**—J. M. Robson—*Blakiston's*, 249 p., \$4. The vast amount of research and consequent increase in knowledge of the subject matter of this book makes this latest addition to the Recent Advances series particularly welcome. The volume is too technical for lay reading but it will be helpful to physicians and other scientists who are interested but lack time to follow the subject in detail in scientific journals.

*Science News Letter*, December 1, 1934

## Medicine

**AMEBIASIS AND AMEBIC DYSENTERY**—Charles F. Craig—*Charles C. Thomas*, 315 p., \$5. This is a timely as well as valuable monograph for physicians and medical scientists.

*Science News Letter*, December 1, 1934

## Psychology

**IMPROVING THE MEMORY FOR FACES AND NAMES**—James D. Weinland—*Bruce Humphries*, 94 p., \$1. The exercises which form a large part of this small volume are so entertaining as to provide diversion for either an individual or a group during the coming winter evenings.

*Science News Letter*, December 1, 1934

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